

Assessment of Marine Environment by Nutrient Analysis-A Case Study around Neelam & Heera Offshore Field of ONGC

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Abstract—Marine ecosystems cover approximately 71% of the Earth's surface and contain approximately 97% of the planet's water. Coastal and estuarine waters are increasingly subject to anthropogenic input and high-quality measurement of nutrients is required to assess the marine ecosystems. The input of the major biologically active nutrients (nitrogen, phosphorous and silicon) to the ocean plays an important role in regulating global oceanic production. In surface waters of the open ocean, uptake of nutrients by organisms usually results in one or more of those nutrients becoming limiting to their growth. Most of these nutrients are terrestrial in origin, finding their way to the oceans via riverine and atmospheric pathways. Once in the marine system, nutrients are made available to biological organisms for primary production either through nutrient-rich water being drawn up from below, or by local regeneration resulting from cell breakdown. In surface waters of the open ocean, uptake of nutrients by organisms usually results in one or more of those nutrients becoming limiting to their growth (i.e. when the nutrient is used up, production ceases). However, coastal and estuarine waters are increasingly subject to anthropogenic input stress, whereby frequent input of nutrients as run-off from agricultural land results in artificially prolonged algal growth. In either case, the need for high-quality measurement of nutrients is driven by economic factors associated with climate change, depleted fisheries, eutrophication and aquatic ecosystems being out of balance.

After the discovery of oil in Western offshore area, Mumbai High in 1974, ONGC increased its attention towards the field and deployed several rigs and commissioned process platforms and more than 100 unmanned platforms. Therefore, there is a need for timescale monitoring of the levels of these nutrients in all the marine resources, so as to establish the trends that could be linked to anthropogenic activities

The paper includes the output of monitoring activities of ONGC considering variation of concentrations of nutrients i.e. phosphate-phosphorous, Nitrite-Nitrogen, Nitrate –Nitrogen and silicates for assessing the influence of E&P activities on marine environment. It has been observed from the study that values of nutrients are well within range of oceanographic range over the years and no particular trend is observed which indicates primary production is not disturbed by exploration and production activities of ONGC's offshore operations.